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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,111	06/30/2003	Takahisa Kato	03500.017366	1040

5514 7590 05/13/2005

FITZPATRICK CELLA HARPER & SCINTO  
30 ROCKEFELLER PLAZA  
NEW YORK, NY 10112

EXAMINER
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RICHARDS, N DREW

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 05/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/608,111

Applicant(s)

KATO ET AL.

Examiner

N-Drew Richards

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 February 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 12 and 13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3 and 9-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Bessho et al. (U.S. Patent No. 5,982,521).

Bessho et al. disclose a microstructure in figures 1-37 and on columns 1-28.

Specifically, Bessho et al. disclose:

a microstructure 200 comprising a support substrate 1 (figure 2);

a movable plate 3 (figure 2); and

an elastic support portion 5 comprising a first section at least one concave portion 54d (figure 31, the concave portion is considered to be the portion labeled 54d that includes the outer edges of portions 54a and 54c such that 54d is concave as shown; figure 31 is an example of the sixth embodiment of their invention, column 20 lines 59-61, the spring 5 of figure 31 is disclosed as being used in the apparatus as shown in figure 2 on column 21 lines 44-46, thus the spring 5 of figure 31 is disclosed as being part of the optical apparatus of figure 2), and second sections 54a/54c having no concave portions, the second sections 54a/54c arranged at both longitudinal ends of the first section 54d and connecting with the movable plate 3 and the support substrate 1, respectively (figure 31);

wherein the movable plate 3 is supported by the elastic support portion 5 so that the movable plate can be freely torsion-vibrated to the support substrate 1 about a torsion axis (figure 2, column 4 lines 16-25).

With regard to claim 2, a length of the first section 54d is not shorter than a half of the entire length of the elastic support portion 5 in the torsion-axis direction.

With regard to claim 3, the first section 54d has a third section in which a depth of the concave portion increases as approaching the center of the first section along the torsion-axis direction, and wherein the third section connects with the second section (see figure 31, the third section is considered the portion along the ends of the first section where the spring 5 becomes thin, the depth is considered the curved portion such that it increases towards a center of 54d).

With regard to claim 9, Bessho et al. disclose a micro optical deflector 100 comprising the microstructure 200 of claim 1, driving means 7 for relatively driving the support substrate 1 and the movable plate 3, and a reflection plane 3m formed on the movable plate 3 to reflect light 10 (figure 2, column 4 line 16 through column 5 line 48).

With regard to claim 10, the micro optical deflector of figure 2 is considered to be an optical apparatus.

With regard to claim 11, figure 2 is also considered to be an image display apparatus. Figure 2 comprises a light source 11 and a micro optical deflector 200 in which at least one micro optical deflector of claim 9 for deflecting the light 10 emitted from the light source 11 is set, wherein at least a part of the light deflected by the micro optical deflector is projected onto an image display body 12. Structure 12 is considered

to be an "image display body" as it is a body that has the image from the light source 11 displayed thereon.

3. Claims 1-3 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Jerman (U.S. Patent No. 5,177,579).

Jerman discloses a microstructure in figure 6, for example, comprising:

a support substrate 81;

a movable plate 83; and

an elastic support portion comprising a first section 88 having at least one concave portion (the corrugations 88 define concave portions), and second sections having no concave portions, the second sections arranged at both longitudinal ends of the first section 88 and connecting with the movable plate 83 and the support substrate 81, respectively (the second section connected with the support substrate is labeled 86, the second section connected to the movable plate is not labeled but is shown as the solid straight portion of the layer to the left of the last corrugated section and to the right of the plate 83),

wherein the movable plate 83 is supported by the elastic support portion so that the movable plate can be freely torsion-vibrated to the support substrate about a torsion axis (though Jerman does not explicitly disclose the plate 83 being torsion-vibrated, the structure is capable of being torsion vibrated and thus reads on the structure claimed).

With regard to claim 2, a length of the first section is not shorter than a half of the entire length of the elastic support portion in the torsion-axis direction.

With regard to claim 3, the first section has a third section in which a depth of the concave portion increases as approaching the center of the first sections along the torsion-axis direction, and wherein the third section connects with the second section. This is seen as the leftmost portion of corrugation 88 where the corrugation begins bending downward such that its depth increases.

With regard to claim 8, the first section has a V-shaped cross section in a plane vertical to the torsion axis.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jerman as applied to claims 1-3 and 8 above, and further in view of Shaw et al. (U.S. Patent No. 6,051,866).

Jerman teach their support substrate 81, elastic support portion 88, movable plate 83 and concave portion being integrally formed (figure 6 shows all structures formed from one piece of material). Jerman further teach that they are formed of silicon (column 9 line 16 and column 10 lines 40-61). Jerman does not teach the structures being formed of a single-crystal material as recited in claim 4. Nor does Jerman teach the single-crystal material being single-crystal silicon as recited in claim 5.

Shaw et al. teach a microelectromechanical structure in figure 7, for example, including a support substrate 154, an elastic support portion 52, and a movable plate 150. Shaw et al. teach forming these structures integrally from single-crystal silicon (abstract).

Jerman and Shaw et al. are combinable because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to form the device of Jerman integrally from single-crystal silicon. The motivation for doing so is that single-crystal silicon has a higher breaking strength and superior electrical properties (Shaw et al. column 1 lines 55-59). Therefore, it would have been obvious to combine Jerman with Shaw et al. to obtain the invention of claims 4 and 5.

With regard to claims 6 and 7, in combination (using single-crystal silicon for the device) the elastic support portion and the concave portion are constituted by equivalent planes of a silicon crystal plane. The elastic portion and concave portion have planar surfaces which necessarily define equivalent planes. It is noted that no specific plane is claimed.

### ***Response to Arguments***

6. Applicant's arguments filed 2/28/05 have been fully considered but they are not persuasive.

Applicant argues that Bessho does not teach the elastic support as claimed with the movable plate connected to the second portion. Applicant states on page 11 lines

7-8 that the holding portion 54c secures the magnet and then argues on page 11 lines 14-17 that the holding portion is not connected with the magnet 3. This is not well understood as applicant seems to be saying on one hand that portion 54c secures the magnet and then on the other hand says that it isn't connected to the magnet. In reviewing the reference, the magnet is secured to portion 54c. Thus, 54c is connected to the magnet and reads on the invention as claimed.

Applicants arguments in regards to the Ives patent are moot in view of the new grounds of rejection presented above.

### ***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.




Art Unit: 2815

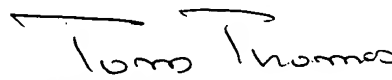
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Drew Richards whose telephone number is (571) 272-1736. The examiner can normally be reached on Monday-Friday 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

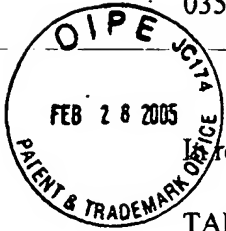
  
NDR

  
TOM THOMAS  
SUPERVISORY PATENT EXAMINER

03500.017366

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



Initial Application of: )  
: Examiner: N.D. Richards  
TAKAHISA KATO, ET AL. )  
: Group Art Unit: 2815  
Application No.: 10/608,111 )  
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Filed: June 30, 2003 )  
:   
For: MICROSTRUCTURE AND ITS ) February 28, 2005  
FABRICATION METHOD )

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

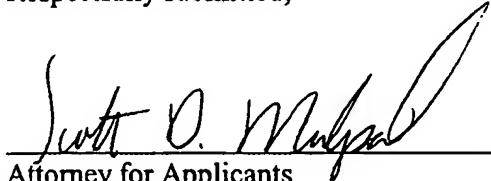
SUBMISSION OF REPLACEMENT SHEETS OF DRAWINGS

Sir:

Enclosed, in accordance with U.S. Patent and Trademark Office Practice, are Replacement Sheets of Figures 14, 15 and 16. These figures have been labelled as --PRIOR ART--. Approval of the Replacement Sheets is respectfully requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

  
\_\_\_\_\_  
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